Original Article

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Physiotherapy Section

Knowledge and Attitude towards Sports Injury Prevention and Management among Sports Playing College Students: A Cross-sectional Study

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ABSTRACT

Introduction: Sports is an emerging field among young people and has gained popularity worldwide. Consequently, the prevalence of sports-related injuries has increased day by day. To address this issue, all types of studies have been conducted. However, the knowledge and attitude of athletes are considered two key factors in preventing sports injuries.

Aim: To determine the current status of knowledge and attitude regarding Sports Injury Prevention and Management (SIPM) among college students engaged in sports.

Materials and Methods: This cross-sectional study was conducted under the affiliation of the College of Physiotherapy, Sumandeep Vidyapeeth, in the Vadodara district, Gujarat, India, from June 2022 to May 2023. A total of 141 male and female participants were included. Demographic details, including gender, number of total practice days per week and prior sports injury experience, were collected. Participants who had experience in playing various outdoor sports were included. The investigator conducted interviews with the participants and the information was noted. The t-test was used for statistical analysis.

Results: The t-test was applied to the SIPM knowledge and attitude scales to analyse differences across demographic factors such as gender, total practice days per week and sports injury experience in the past year. The results showed no significant differences among subjects ($t(141)=1.89$, p-value>0.05). Pearson's correlation analysis revealed that total knowledge scores and total attitude scores of SIPM among student athletes were positively correlated ($r=0.3$, p-value=0.003).

Conclusion: The study concluded a positive correlation between knowledge and attitude, indicating that higher levels of knowledge are associated with a more positive attitude towards prevention and management of sports injuries.

Keywords: Attitude toward sports injuries, College athletes, Knowledge of sports injuries, Sports injury education, Sports injury management, Sports-playing students

INTRODUCTION

In India, sports is one of the fields that has frequently brought distinction to the country. Promoting a physically active lifestyle is advocated worldwide, particularly due to its numerous health benefits. Participation in sports has several positive effects on health, including lowering the risk of diabetes, hypertension, cardiovascular disease and obesity. However, for athletes, this also increases the risk of injury [1]. There is a lack of research investigating the direct impact of coach and player knowledge on promoting behaviours aimed at preventing injuries [2].

Engaging in physical activity carries the potential for injury. Over time, there has been substantial advancement in the use of sporting equipment, as well as improved knowledge of injury prevention and care [3]. Despite this, the frequency of injuries and identification of new injuries continue to rise. Most physically active individuals experience some form of injury during their active lifestyles [4]. Intercollegiate athletes have a higher incidence of sports injuries. Sports injuries not only affect the musculoskeletal system but also influence the psychological wellbeing of the injured athlete [5]. This, in turn, impacts health, athletic performance, and increases the risk of re-injury. Despite these consequences, injured athletes still rely primarily on the physical aspects of prevention and recovery [6].

Research suggests that self-concept, beliefs, commitments, values and socio-economic factors may influence injury prevention and the management of sports injuries. Empirical evidence shows that preventable injuries occur, and both prevention and rehabilitation are hampered by a failure to address psychological as well as physical components [7].

Attitude towards health is not an isolated component of an individual's personality but influences overall behaviour, particularly health-protective behaviour. Constructs of health-protective behaviour include the characteristics of health-promoting activity, the concept of an "illness career," and behaviour in situations of declining health, which provide a functional framework for understanding health-protective behaviour [8]. The structural component of internal health state correlates with that of external health state [9]. Although attitude towards health is a component of health-protective behaviour, its role varies depending on age, field of activity, and other factors [10].

While numerous studies have focused on the management of sports injuries, research examining knowledge and attitudes surrounding SIPM is limited [11]. Therefore, this study aimed to assess the knowledge and attitude regarding sports injuries among college students who participate in sports in Vadodara, Gujarat, India. The primary objective of this study was to assess the knowledge of SIPM in sports-playing college students using the Knowledge and Attitude SIPM questionnaire. The secondary objective was to assess the attitude towards SIPM in the same population.

MATERIALS AND METHODS

This cross-sectional study was conducted over one year (June 2022 to May 2023) and was affiliated with the College of Physiotherapy, Sumandeep Vidyapeeth University, Vadodara, Gujarat, India. The study protocol was approved by the Sumandeep Vidyapeeth

Institutional Ethics Committee (SVIEC/ON/PHYS/BNMPT21/D22024) and subsequently registered with the Clinical Trials Registry-India (CTRI/2022/10/046586). The study included sports-playing college students from Commerce, Arts and Science streams who practiced at sports complexes in Vadodara city.

Inclusion criteria: College students (male and female) who were willing to participate, aged 18-30 years and who played outdoor sports at local, university, state, or national levels were included in the study.

Exclusion criteria: Irregular and indoor game players were excluded from the study.

Sample size: Convenient sampling was used to collect data from the sports complexes of Vadodara, including Sama Sports Complex, Manjalpur Sports Complex, Ajwa Sports Complex and Akota Sports Complex.

$n=NZ^2 P(1-P)/ d^2 (N-1)+Z^2 P(1-P)$

Where,

n=sample size with finite population correction

N=Population size

Z=Z statistic for a level of confidence

P=expected proportion for the prevalence 20% [12]

D=precision for 5%

The required sample size was calculated to be 136 subjects, considering the droput, final sample size was 141 subjects.

Study Procedure

After obtaining ethical approval, the Head of Department of sports complexes in Vadodara city was approached. Data collection was scheduled according to participants' availability. The study procedures were explained to all willing participants, who were then requested to complete an Informed Consent Form. Participant selection was based on the inclusion criteria.

A Google Form (https://forms.gle/EM3K7qD4EW4W3LAo9) was created, containing questions related to knowledge of SIPM and attitudes toward SIPM [Annexure-1,2]. The structured questionnaire included demographic characteristics and assessed participants' knowledge and attitudes regarding SIPM. The content of the questionnaire was validated by six experts in injury incidence, school health, nursing, and physical education, resulting in a Cronbach's alpha of 0.884 and a content validity index of 0.80. The experts evaluated content relevance, suitability, and clarity [13].

The Google Form link was shared with participants via WhatsApp. In the presence of the investigator, participants were asked to complete and submit the questionnaire independently. The investigator ensured that responses were submitted successfully.

Outcome Measures

Knowledge test: The knowledge questionnaire contained 25 items. Each correct answer was awarded 4 points, and incorrect answers received 0 points. Participants who correctly answered 15 or more items (≥60 points) were considered to have a reasonable understanding of SIPM. The maximum total score was 100 (25 questions × 4 points).

Attitude scale towards SIPM: The attitude questionnaire included 18 items with a maximum total score of 90. Responses were recorded on a 6-point Likert scale (ranging from 0 to 5), with higher scores indicating a more positive attitude toward SIPM. The scoring system was adapted from a published article [14].

STATISTICAL ANALYSIS

All statistical analyses were performed using Statistical Package for the Social Sciences (SPSS) version 25.0. Normality of variables was tested. Descriptive statistics were reported as mean±Standard Deviation (SD). The mean±SD of the knowledge and attitude scales were calculated. The t-test was used to compare SIPM knowledge and attitude scores across demographic factors, including gender, total practicing days per week and recent sports injury experience.

RESULTS

Demographic Information and Status of Knowledge and Attitude

Three demographic variables were assessed:

1. **Gender:** 95 participants (67.4%) were male, and 46 participants (32.6%) were female.
2. **Total practicing days per week:** 19 participants (13.5%) practiced ≤4 days per week, while 122 participants (86.5%) practiced ≥5 days per week.
3. **History of sports injury:** 54 participants (38.3%) reported experiencing a sports injury in the past, whereas 87 participants (61.7%) reported no prior sports injury.

Knowledge: In participants who experienced a sports injury in the past year, incorrect response rates were higher among males than females, while females showed a higher correct response rate and better data interpretation [Table/Fig-1].

Item	Mean±SD	Correct rate (%)	Male n=95 Correct rate (%)	Female n=46 Correct rate (%)
1	1.73±1.99	0.43	0.47	0.35
2	2.41±1.96	0.60	0.62	0.57
3	1.93±2.01	0.48	0.58	0.28
4	2.70±1.88	0.67	0.72	0.59
5	1.73±1.99	0.43	0.45	0.39
6	1.84±2.00	0.46	0.55	0.28
7	1.11±1.80	0.28	0.32	0.20
8	1.45±1.93	0.36	0.35	0.39
9	2.04±2.01	0.51	0.54	0.46
10	1.36±1.90	0.34	0.33	0.37
11	1.84±2.00	0.46	0.51	0.37
12	2.01±2.01	0.50	0.52	0.48
13	1.33±1.89	0.33	0.35	0.30
14	1.22±1.85	0.30	0.28	0.35
15	2.30±1.98	0.57	0.62	0.48
16	1.96±2.01	0.49	0.53	0.41
17	2.07±2.01	0.52	0.53	0.50
18	0.94±1.70	0.23	0.27	0.15
19	1.70±1.98	0.43	0.47	0.33
20	1.42±1.92	0.35	0.40	0.26
21	2.10±2.00	0.52	0.56	0.46
22	1.22±1.85	0.30	0.35	0.22
23	2.04±2.01	0.51	0.56	0.41
24	1.13±1.81	0.28	0.31	0.24
25	1.96±2.01	0.49	0.48	0.50

[Table/Fig-1]: Distribution of the rates of knowledge of sports injuries' prevention and management. The correct rate (%) was calculated using the following formula: =100* no. of correct responses/total participants.

Attitude: The results showed an average total score of 57.63, and the mean score for individual items exceeded 4 points. These findings suggest that the participants generally held a positive attitude toward SIPM [Table/Fig-2].

Effect of demographic factors on knowledge: The t-test was applied to analyse the effect of demographic factors—gender, total practicing days per week, and sports injury experience in the past year—on SIPM knowledge [Table/Fig-3].

S. No.	Particular	SD	Mean
1	Question 1	2.79	1.7
2	Question 2	3.09	1.58
3	Question 3	3.05	1.56
4	Question 4	3.09	1.63
5	Question 5	3.06	1.57
6	Question 6	3.04	1.66
7	Question 7	3.18	1.51
8	Question 8	3.23	1.52
9	Question 9	3.18	1.53
10	Question 10	3.17	1.54
11	Question 11	3.26	1.49
12	Question 12	3.37	1.51
13	Question 13	3.67	1.18
14	Question 14	3.28	1.47
15	Question 15	3.21	1.53
16	Question 16	3.38	1.41
17	Question 17	3.38	1.39
18	Question 18	3.21	1.53
Total		57.64	27.31

[Table/Fig-2]: Scale for sport injury prevention and management of attitude.

		N	Mean±SD	t value	p-value	Intergroup difference
Gender	Male	95	46.57±23.88	2.40717	0.01739	M > F
	Female	46	37.3±15.06			
Total practicing days a week	<4 days	19	41.68±22.68	0.3992	0.69	Not significant for knowledge and total practicing days
	5 or more than 5 days	122	43.84±21.73			
Sports injury experience	Yes	54	39.19±20.68	1.89	0.061	Not significant for knowledge and sports injury experience
	No	87	46.25±22.13			

[Table/Fig-3]: Demographic factors on the knowledge of subjects.

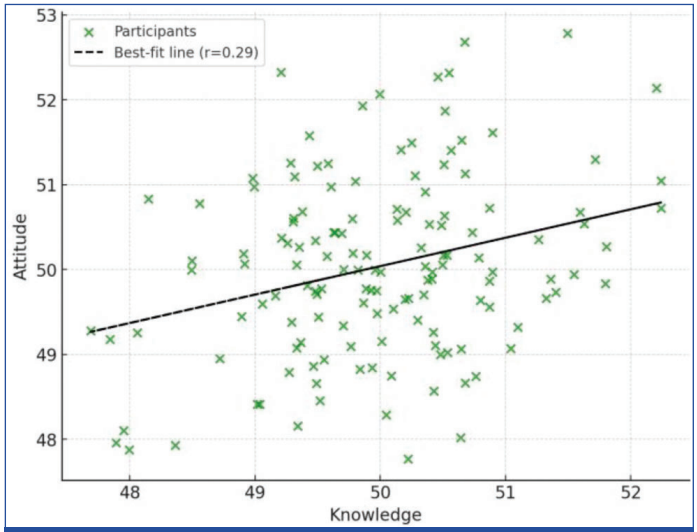
Gender: Male participants had a significantly higher total knowledge score than female participants (t=2.40, p-value<0.05), indicating that males demonstrated greater knowledge. No significant difference in knowledge was observed between participants who practiced ≤4 days and those who practiced ≥5 days per week (t=0.399, p-value>0.05). There was no significant difference in knowledge between participants with or without recent sports injury experience (t=1.89, p-value>0.05).

Effect of demographic factors on attitude: The t-test was applied to analyse the effect of demographic factors, including gender, total practicing days per week, and sports injury experience in the past year, on the attitude toward SIPM. Male participants showed a more positive attitude than female participants, with a higher total knowledge score of SIPM (t=2.82, p-value<0.0054) [Table/Fig-4].

Correlation between knowledge and attitude of sports-playing college students: Pearson's correlation showed that the total knowledge score and total attitude score of SIPM among college athletes were positively correlated (r=0.3, p-value=0.003). This suggests that higher knowledge scores are associated with a more positive attitude toward SIPM [Table/Fig-5].

		N	Mean±SD	t value	p-value	Intergroup difference
Gender	Male	95	60.71±18.97	2.82685	0.0054	M > F
	Female	46	51.28±17.67			
Total practicing days a week	Less than 4 days	19	50.84±21.55	1.684	0.094	Not significant for attitude and total practicing days
	5 or more than 5 days	122	58.69±18.46			
Sports injury experience	Yes	54	59.46±18.72	0.965	0.185	Not significant for attitude and sports injury experience
	No	87	56.49±19.21			

[Table/Fig-4]: Demographic factors on the attitude of subjects.



[Table/Fig-5]: Correlation between knowledge and attitude scores.

DISCUSSION

The primary aim of this study was to assess knowledge and attitude towards SIPM in sports-playing college students. Understanding these factors is essential to reducing the incidence of sports injuries and enhancing athletes' performance. The study evaluated three components: demographics, knowledge, and attitude.

Among participants, 67.4% were male and 32.6% were female. Similar findings have been reported, showing that 62% of males and 38% of females experienced sports injuries [15]. This discrepancy may be attributed to differences in total practice time, which was higher in male participants. Previous study by Sohail M and Ashraf HS (2022), Kalra SK and Sinha AG (2017), Karthikeyan, (2019) identified participation in high-risk sports as a major contributing factor to injuries [16-18]. This study also found that inadequate warm-up and stretching, incorrect techniques, and the use of inappropriate clothing, footwear, or protective devices were common contributors to sports injuries. These results align with findings from Finch et al., (2002), who reported that insufficient warm-up and excessive practice were major causes of injuries in school athletes [19].

Status of demographic factors and knowledge of subjects: This study found that male participants demonstrated greater knowledge than female participants. Both male and female participants scored lowest on question 18, which pertained to precautions necessary to manage overheating during exercise. These findings are supported by Fradkin AJ et al., (2006), Bakar NA and Shaharudin MS (2022), Wang KM et al., (2012) suggesting that athletes often prioritise performance over health education related to sports injuries. Coaches and physical education teachers are frequently the primary sources of knowledge for student-athletes, and their expertise and teaching methods play a crucial role in shaping athletes' understanding and attitudes. In competitive sports environments, there is often pressure to prioritise performance over health, leading athletes to neglect injury prevention or management [20-22].

Status of demographic factors and attitude of subjects: The findings indicated that participants generally had a positive attitude towards SIPM. The mean attitude score for all subjects was 57.63,

suggesting consistently good attitudes towards SIPM. College students engaged in sports appeared to have a positive attitude towards SIPM, likely influenced by the number of days of exposure to sports activities and individual awareness regarding injury management [22].

Correlation between knowledge and attitude: The results revealed that sports-playing college students with greater knowledge exhibited more positive attitudes toward SIPM. McManus A et al., (2006) reported that hockey coaches recognise the importance of injury prevention and implement strategies to reduce injury risk [23]. However, despite positive attitudes, coaches often face obstacles that impede the implementation of such strategies. Key challenges include limited skills and inadequate training on injury prevention and management [24], insufficient knowledge to identify potential risks or preventive measures and restricted resources, such as lack of equipment, facilities, or financial support [25]. Time constraints, especially in youth coaching, further hinder the ability to develop and apply effective injury prevention strategies [26,27]. Overall, despite positive attitudes, the combination of limited skills, knowledge and resources presents significant challenges for coaches. Therefore, it is essential to provide coaches with adequate tools, resources, and education to create a safer environment for athletes [27].

The study observed a positive correlation between knowledge and attitude towards SIPM. In other words, individuals with higher knowledge levels tended to exhibit more positive attitudes. These findings suggest that increased knowledge is associated with more favourable attitudes towards SIPM among college athletes.

Limitation(s)

This study included only participants from Vadodara city, with an uneven gender distribution. The coaches or guides of the athletes were not included, although they play a crucial role in teaching and training athletes. Non medical athletes may have an unclear understanding of SIPM; however, if coaches impart knowledge effectively, it could significantly improve athletes' ability to handle sports-related injuries.

CONCLUSION(S)

This study underscores the importance of educational interventions to improve knowledge, particularly among athletes, as higher knowledge correlates with more positive attitudes. The findings suggest that structured injury prevention programs targeting both knowledge and attitudes could promote better injury management and prevention behaviours among college athletes.

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KNOWLEDGE SCALE- [ANNEXURE 1]

SIPM Knowledge Questionnaire

1. **Sports protective devices are helpful to stabilise joints. They are used:**
   1. When engaging in intense exercise
   2. When suffering injuries
   3. After exercise
   4. **During any and all types of exercise.**
2. **What do we call a sports injury that damages the ligaments:**
   1. Fracture
   2. **Sprain**
   3. Strain
   4. Contusion
3. **What do we call a sports injury that damages the muscles and tendons:**
   1. Fracture
   2. Sprain
   3. **Strain**
   4. Contusion
4. **What do we call a sports injury that displaces a bone due to collision with external force:**
   1. Sprain
   2. **Dislocation**
   3. Strain
   4. Contusion
5. **The standard procedure to treat a sports injury does not include:**
   1. Cold compress
   2. Pressure
   3. **Fracture test**
   4. Elevation
6. **What is the first-aid method for strains?**
   1. Treat the site of injury with hot compress immediately
   2. **Stabilise the site of injury and rest immediately**
   3. Massage the site of injury immediately
   4. Lower the site of injury immediately to relieve pain
7. **The purpose of learning correct sports injury handling principles is not to:**
   1. Reduce post-recovery after-effects
   2. Help yourself and help others
   3. Reduce the possibility of injury
   4. **Improve sports skills**
8. **After injury what should you do to hasten your return to the sports field?**
   1. Continue to exercise as long as the pain is bearable
   2. Exercise as much as possible to avoid loss of muscle strength
   3. **Do not exercise without the permission of a doctor**
   4. Pull and tug the site of injury to accelerate the rehabilitation
9. **How to use limb supports correctly?**
   1. Keep it loose to allow free movement of the injured limb
   2. **Keep it tight but not too tight that it affects circulation**
   3. Keep it tight and apply pressure directly on the injured limb
   4. Keep it loose for ease of movement
10. **Which one of the following is the wrong way to support a limb?**
    1. The limb can be well supported using appropriate devices
    2. The support must be mounted across the injured limb
    3. **The joint must be repositioned before medical professionals arrive to avoid deformation**
    4. Avoid pressing on the injured limb directly
11. **What is the correct way to use a bandage?**
    1. Wrap from the near end of the injured limb
    2. **Wrap from the extremity of the injured limb**
    3. Wrap the site of injury directly
    4. As tight as possible no matter which method is used
12. **What is the cardiac massage frequency per minute when applying CPR to teenagers?**
    1. 50-70
    2. **80-100**
    3. 100-120
    4. 60-80
13. **What is the ratio of cardiac massage to breathing per minute when applying CPR to adults?**
    1. 12 1
    2. 5 1
    3. **30 2**
    4. 15 1
14. **What is the interval between hot/cold compresses?**
    1. 5 minutes
    2. 5~10 hours
    3. **2~3 hours**
    4. No interval
15. **How long should a hot or cold compress be applied for a sports injury?**
    1. 5 minutes
    2. **15~20 minutes**
    3. 25~30 minutes
    4. As long as possible
16. **What is the reason for heatstroke?**
    1. Insufficient salt content in the blood
    2. Too much carbohydrates
    3. **Insufficient fluids**
    4. Too much fluids
17. **What is the best preventive action to avoid heatstroke?**
    1. Limit absorption of salts
    2. Limit rest time
    3. **Drink adequate quantities of water**
    4. Prevention from heatstroke is not possible. It is better to let nature take its course
18. **What action should not be followed when someone suffers overheating during exercise?**
    1. Give sufficient fluids
    2. Move the victim to a cool place
    3. Let the victim rest till the symptoms of overheating disappear
    4. **Cover the victim with a heavy and thick blanket to avoid temperature loss**
19. **What is heatstroke?**
    1. It is commonly seen and special care of the victim is not required

2. **It can be prevented**
3. It is not life-threatening
4. It rarely occurs at sports grounds

20. **Which one of the following is not a symptom of heatstroke?**
    1. Shortness of breath
    2. **Profuse sweating**
    3. Inability to sweat
    4. Constricted pupils
21. **What is the purpose of dressing a bleeding wound?**
    1. Relieve pain
    2. Make the wound beautiful
    3. **Control bleeding and prevent infection**
    4. To enable transportation of the victim
22. **Which one of the following is the wrong way to treat a bleeding wound?**
    1. **If any foreign matter is on or in the wound, remove it immediately**
    2. The hemostatic gauze for the wound must be clean
    3. Raise the injured limb to the level of the heart
    4. Don't take any hemostatic drugs before medical treatment
23. **What should be done to treat a severely bleeding wound?**
    1. Let it bleed thus allowing the blood to clean the wound and avoid infection
    2. **Dress the wound with a tourniquet or apply pressure directly on the wound to stop bleeding**
    3. Do nothing and wait for the bleeding to stop
    4. Raise the injured limb even if the victim has suffered a fracture; otherwise, the wound might become untreatable
24. **What is shock:**
    1. It is not life-threatening
    2. **It may accompany any injuries**
    3. It only accompanies injuries to the head or heat-related illnesses
    4. It only accompanies chronic injuries
25. **Which one of the following methods is the wrong way to treat shock?**
    1. Elevate the lower limbs if there is no bone injury
    2. **Enforced intake of solids and liquids are required to maintain the life of the victim**
    3. Maintaining good air circulation is required
    4. Maintain coolness of the area

Note: In the above questionnaire, the correct options are highlighted with bold

ATTITUDE SCALE- [ANNEXURE 2]

SIPM Attitude Questionnaire

1. Sport injuries can be prevented by correctly attitudes.
2. It's important to concern one's physical and mental conditions during exercises.
3. Players should wear appropriate clothes and shoes.
4. Players should wear properly fit protective equipment such as pads, helmets and protective cups.
5. Players should not assume that protective equipment will protect them from performing more dangerous or risky activities.
6. Stretching exercises before and after games or practice can increase flexibility and prevent injuries.
7. A proper warm up can reduce injury and improve performance.
8. Dehydration can kill one's performance and raise injuries opportunity, so stay well hydrated.
9. Rest periods during practice and games can reduce injuries and prevent heat illness.
10. Rest can make ones' stronger and prevent injuries of overuse, fatigue and poor judgments.
11. It's important to determine whether the injured and properly handle.
12. It's important to handle the bleeding situation correctly.
13. It's important to handle the sprain, strain and muscle spasm situation correctly.
14. It's important to assess the vital signs and perform CPR when someone got shock in the field.
15. It's important to move injured off the field correctly.
16. It's important to start the emergency medical system as soon as possible when someone got seriously injured.
17. Sport injuries can be reduced by teaching proper knowledge of prevention and management.
18. Sport injuries incidence of students or athletes can be reduced by curriculum design.

SCORING options:

Options	Score
Strongly disagree	1
Disagree	2
Slightly disagree	3
Slightly agree	4
Agree	5
Strongly agree	6